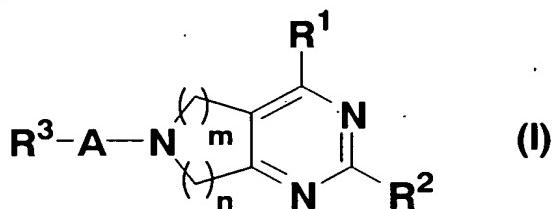


Claims

1. A bicyclic pyrimidine derivative represented by following Formula (I):



{wherein

m and n may be the same or different, and each represents an integer of 1 to 3 wherein m + n is 4 or less;

R¹ represents

-NR⁴R⁵ (wherein

R⁴ and R⁵ may be the same or different and each represents a hydrogen atom, substituted or unsubstituted lower alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted lower alkenyl, substituted or unsubstituted lower alkynyl, substituted or unsubstituted aralkyl, substituted or unsubstituted arylcarbonyl, a substituted or unsubstituted heteroaromatic group, a substituted or unsubstituted heteroalicyclic group, substituted or unsubstituted heteroaromatic-substituted alkyl or substituted or unsubstituted heteroalicyclic-substituted alkyl, or R⁴ and R⁵ are combined together with the adjacent nitrogen atom to form a substituted or unsubstituted heteroalicyclic group, provided that R⁴ and R⁵ are not simultaneously hydrogen atoms, and that when one of R⁴ and R⁵ is a hydrogen atom, the other of R⁴ and R⁵ is neither a substituted or unsubstituted pyrazol-3-yl nor a substituted or

unsubstituted 1,2,4-triazol-3-yl);

R² represents

(i)-B-(CX₂)_p-R⁷ [wherein

B represents -O-, -CH=CH-, -C≡C- or phenylene;

p represents an integer of 1 to 4;

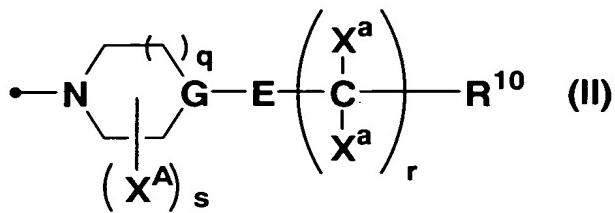
X_s may be the same or different respectively, and each represents a hydrogen atom, substituted or unsubstituted lower alkyl or halogen; and

R⁷ represents

-NR⁸R⁹ (wherein

R⁸ and R⁹ may be the same or different and each represents a hydrogen atom, substituted or unsubstituted lower alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted lower alkenyl, substituted or unsubstituted lower alkynyl, substituted or unsubstituted aralkyl, substituted or unsubstituted aryl, a substituted or unsubstituted heteroaromatic group, a substituted or unsubstituted heteroalicyclic group, substituted or unsubstituted heteroaromatic-substituted alkyl or substituted or unsubstituted heteroalicyclic-substituted alkyl), a substituted or unsubstituted heteroaromatic group or a substituted or unsubstituted heteroalicyclic group];

(ii) Formula (II):



[wherein

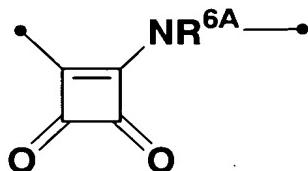
r represents an integer of 0 to 4;

s represents a number ranging from 0 to a substitutable number;

G represents a nitrogen atom, CH, C(OH), C(CO₂H) or C(CN);

q represents an integer of 1 or 2 when G is a nitrogen atom, and q represents an integer of 0 to 2 when G is CH, C(OH), C(CO₂H) or C(CN);

E represents a single bond, -C(=O)-, -O-, -CH(OH)-, -CH₂CH(OH)-, -C(=O)O-, -C(=O)NR⁶- (wherein R⁶ represents a hydrogen atom, substituted or unsubstituted lower alkyl or substituted or unsubstituted cycloalkyl) or



(wherein R^{6A} has the same meaning as R⁶ defined above),

and E is bonded to G at the left side in each group;

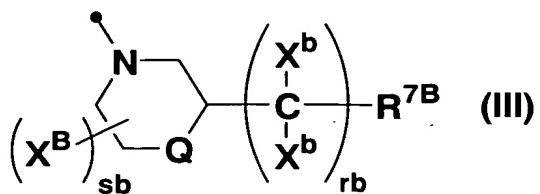
X^A represents substituted or unsubstituted lower alkyl or halogen, or two X^A's on the same carbon atom are combined together to form oxo, wherein respective X^A's may be the same or different when s is 2 or more;

X^a has the same meaning as X defined above, where respective X^a's may be the same or different when r is 1 or more; and R¹⁰ represents

-NR^{8A}R^{9A} (wherein

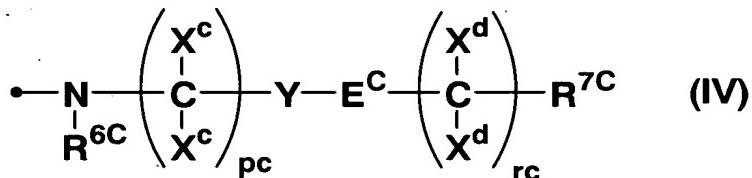
R^{8A} and R^{9A} may be the same or different and each represents a hydrogen atom, substituted or unsubstituted lower alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted lower alkenyl, substituted or unsubstituted lower alkynyl, substituted or unsubstituted aralkyl, substituted or unsubstituted aryl, a substituted or unsubstituted heteroaromatic group, a substituted or unsubstituted heterocyclic group, substituted or unsubstituted heteroaromatic-substituted alkyl, substituted or unsubstituted heterocyclic-substituted alkyl, imino-(lower alkyl) or substituted or unsubstituted amidino),
a hydrogen atom, substituted or unsubstituted lower alkyl, substituted or unsubstituted lower alkoxy, substituted or unsubstituted cycloalkyl, substituted or unsubstituted lower alkenyl, substituted or unsubstituted lower alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted aralkyl, a substituted or unsubstituted heteroaromatic group, a substituted or unsubstituted heterocyclic group, substituted or unsubstituted heteroaromatic-substituted alkyl or substituted or unsubstituted heterocyclic-substituted alkyl];

(iii) Formula (III):



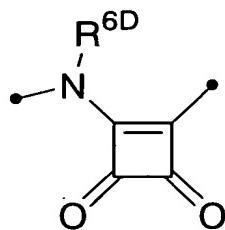
[wherein sb, rb, X^B, X^b and R^{7B} have the same meanings as s, r, X^A, X^a and R⁷ defined above, respectively; and Q represents -O-, -S-, -CH₂- or -NR^{6B}- (wherein R^{6B} has the same meaning as R⁶ defined above)] or

(iv) Formula (IV):

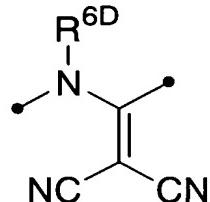


[wherein pc, rc, E^C, X^c, X^d and R^{6C} have the same meanings as p, r, E, X, X^a and R⁶ defined above, respectively; R^{7C} represents -NR⁸R⁹ (wherein R⁸ and R⁹ have the same meaning as defined above, respectively), a substituted or unsubstituted heteroaromatic group or a substituted or unsubstituted heterocyclic group; and Y represents a single bond, -O- or -NR^{6D}- (wherein R^{6D} has the same meaning as R⁶ defined above)].

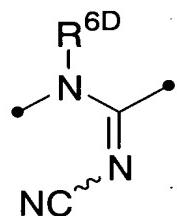
A represents a single bond, -C(=O)-, -SO₂- , -NR^{6D}C(=O)- (wherein R^{6D} represents a hydrogen atom, substituted or unsubstituted lower alkyl or substituted or unsubstituted cycloalkyl, or is combined together with R³ and the adjacent nitrogen atom to form a substituted or unsubstituted heterocyclic group), -NR^{6D}C(=S)- (wherein R^{6D} has the same meaning as defined above), -OC(=O)-, -OC(=S)-, -SC(=O)-, -SC(=S)-,



(wherein R^{6D} has the same meaning as defined above),

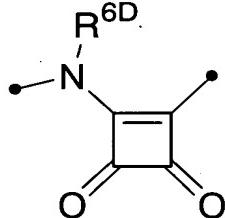


(wherein R^{6D} has the same meaning as defined above) or

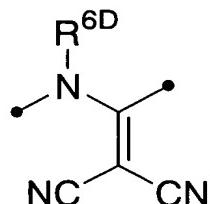


(wherein R^{6D} has the same meaning as defined above), and A is bonded to R³ at the left side in the each group; and

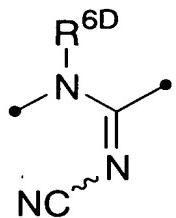
(a) when A is a single bond,



(wherein R^{6D} has the same meaning as defined above),



(wherein R^{6D} has the same meaning as defined above) or



(wherein R^{6D} has the same meaning as defined above),

R³ represents a hydrogen atom, substituted or unsubstituted lower alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted lower alkenyl, substituted or unsubstituted lower alkynyl, substituted or unsubstituted aralkyl, substituted or unsubstituted aryl, a substituted or unsubstituted heteroaromatic group, a substituted or unsubstituted heteroalicyclic group, substituted or unsubstituted heteroaromatic-substituted alkyl or substituted or unsubstituted heteroalicyclic-substituted alkyl, and
 (b) when A is -C(=O)-, -SO₂- , -NR^{6D}C(=O)- (wherein R^{6D} has the same meaning as defined above), -NR^{6D}C(=S)- (wherein R^{6D} has the same meaning as defined above), -OC(=O)-, -OC(=S)-, -SC(=O)- or -SC(=S)-,

R³ represents substituted or unsubstituted lower alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted lower alkenyl, substituted or unsubstituted lower alkynyl, substituted or unsubstituted aralkyl, substituted or unsubstituted aryl, a substituted or unsubstituted heteroaromatic group, a substituted or unsubstituted heteroalicyclic group, substituted or unsubstituted heteroaromatic-substituted alkyl, substituted or unsubstituted heteroalicyclic-substituted alkyl or -NR^{8B}R^{9B} (wherein R^{8B} and R^{9B} have the same meanings as R⁸ and R⁹ defined above, respectively)),

or a quaternary ammonium salt thereof, or a pharmaceutically acceptable salt thereof.

2. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 1, wherein n is 2; and m is 1.

3. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 1, wherein n and m are 2.

4. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 3, wherein R⁴ is a hydrogen atom; and R⁵ is substituted or unsubstituted aralkyl.

5. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claims 1 to 3, wherein R⁴ is a hydrogen atom; and R⁵ is substituted or unsubstituted cycloalkyl.

6. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 5, wherein R² is -B-(CX₂)_p-R⁷ (wherein p, X, B and R⁷ have the same meanings as defined above, respectively).

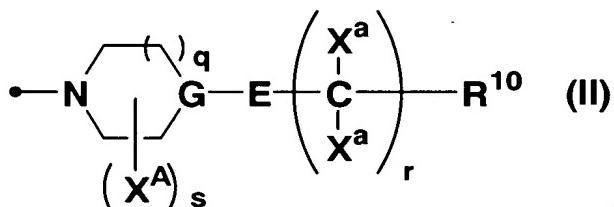
7. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 6, wherein X is a hydrogen atom.

8. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 6 or 7, wherein A is -C(=O)- or a single bond.

9. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof

according to any of claims 6 to 8, wherein R³ is substituted or unsubstituted cycloalkyl or substituted or unsubstituted aralkyl.

10. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 5, wherein R² is Formula (II):



(wherein q, r, s, X^A, X^a, G, E and R¹⁰ have the same meanings as defined above, respectively).

11. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 10, wherein s is 0.

12. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 10 or 11, wherein q is 1 or 2.

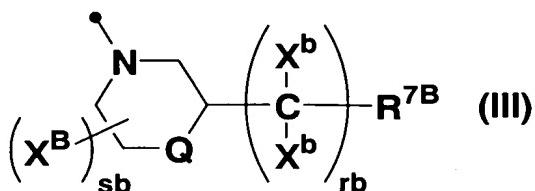
13. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 10 to 12, wherein X^a is a hydrogen atom.

14. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 10 to 13, wherein R¹⁰ is -NR^{8A}R^{9A} (wherein R^{8A} and R^{9A} have the same meanings as defined above, respectively), a substituted or unsubstituted heteroaromatic group or a substituted or unsubstituted heteroalicyclic group.

15. The bicyclic pyrimidine derivative, or the quaternary ammonium

salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 10 to 14, wherein R³ is substituted or unsubstituted lower alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted aralkyl, substituted or unsubstituted aryl or a substituted or unsubstituted heteroaromatic group.

16. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 5, wherein R² is Formula (III):



(wherein sb, rb, X^b, X^b, R^{7B} and Q have the same meanings as defined above, respectively).

17. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 16, wherein sb is 0.

18. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 16 or 17, wherein Q is -O-.

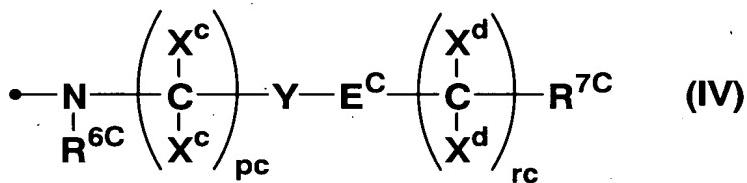
19. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 16 to 18, wherein X^b is a hydrogen atom.

20. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 16 to 19, wherein R^{7B} is a substituted or unsubstituted heteroalicyclic group.

21. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 16 to 20, wherein A is -C(=O)- or -NHC(=O)-.

22. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 16 to 21, wherein R³ is substituted or unsubstituted lower alkyl or substituted or unsubstituted cycloalkyl.

23. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 5, wherein R² is Formula (IV):



(wherein pc, rc, Y, E^c, X^c, X^d, R^{6C} and R^{7C} have the same meanings as defined above, respectively).

24. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 23, wherein X^c and X^d are hydrogen atoms.

25. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to claim 23 or 24, wherein A is -C(=O)- or -SO₂-.

26. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 23 to 26, wherein R³ is substituted or unsubstituted lower alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted aralkyl, substituted

or unsubstituted aryl or a substituted or unsubstituted heteroaromatic group.

27. The bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 26, wherein the quaternary ammonium salt is a quaternary ammonium salt formed by the addition of Z-Hal (wherein Z represents substituted or unsubstituted lower alkyl or substituted or unsubstituted lower alkenyl; and Hal represents a halogen) to any nitrogen atom in R⁷, R^{7B}, R¹⁰ or R^{7C}.

28. A pharmaceutical composition which comprises, as an active ingredient, the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

29. An anti-inflammatory agent which comprises, as an active ingredient, the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

30. A modulator of the function of thymus and activation-regulated chemokine [TARC; CC chemokine ligand 17 (CCL17)] and/or macrophage-derived chemokine [MDC; CC chemokine ligand 22 (CCL22)], which comprises, as an active ingredient, the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

31. A therapeutic and/or preventive agent for a disease which is related to TARC (CCL17) and/or MDC (CCL22), which comprises, as an active ingredient, the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

32. A therapeutic and/or preventive agent for a disease which is related to T cells, which comprises, as an active ingredient, the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

33. A therapeutic and/or preventive agent for an allergic disease which comprises, as an active ingredient, the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

34. Use of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27, for the manufacture of an anti-inflammatory agent.

35. Use of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27, for the manufacture of a modulator of the function of TARC (CCL17) and/or MDC (CCL22).

36. Use of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27, for the manufacture of a therapeutic and/or preventive agent for a disease which is related to TARC (CCL17) and/or MDC (CCL22).

37. Use of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27, for the manufacture of a therapeutic and/or preventive agent for a disease which is related to T cells.

38. Use of the bicyclic pyrimidine derivative, or the quaternary

ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27, for the manufacture of a therapeutic and/or preventive agent for an allergic disease.

39. A method for treating and/or preventing inflammation, which comprises administering an effective amount of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

40. A method for modulating the function of TARC (CCL17) and/or MDC (CCL22), which comprises administering an effective amount of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

41. A method for treating and/or preventing a disease which is related to TARC (CCL17) and/or MDC (CCL22), which comprises administering an effective amount of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

42. A method for treating and/or preventing a disease which is related to T cells, which comprises administering an effective amount of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.

43. A method for treating and/or preventing an allergic disease, which comprises administering an effective amount of the bicyclic pyrimidine derivative, or the quaternary ammonium salt thereof, or the pharmaceutically acceptable salt thereof according to any of claims 1 to 27.